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THE MASSIVE RESECTION OF BONE SARCOMA WITH IMMEDIATE BONE GRAFT REPLACEMENT*

FRED H. ALBEE, M. D.
New York, N. Y.

I appreciate the honor of addressing your 150th anniversary, but until quite recently, it was problematical as to whether I could be here to do it. Some of you may know that I was practically marooned in Berlin at the time England and France declared war upon Germany. If you have never had the experience of trying to get out of Europe under similar circumstances, you would hardly realize the difficulties encountered.

Travellers in Europe were caught in a maelstrom of war racketeering. Even people who had their return steamship tickets to America six months, or a year in advance, were forced either to relinquish them, or pay a bonus of war risk insurance which averaged around $110.00 per person, depending upon accommodations. Added to this melee was the plight of a tremendous number of refugees desperately trying to leave Europe.

I don't know what would have happened if it hadn't been for the frequent helpful cables from the State Department; the Governor of New Jersey; and peculiarly, the Police Department of New York—whose inquiries concerning my whereabouts were, for the first time in my life, most welcome.

The subject which has been allotted to me today is a very timely, and important one—that is, the treatment of bone sarcoma by massive resection. We might just briefly review the present-day status of treating malignant tumors.

I have been unusually situated in New York so that I have been able to keep my finger on the pulse of the profession and observe their handling of these problems.

*Read before the Medical Society of Delaware, Wilmington, October 11, 1939.

We have four different treatments which immediately present themselves: deep x-ray and radium therapy, curettement, massive resection, and amputation. Right here, we might discuss deep therapy. Should it be used before an operation?

Personally, I feel that there is great hazard in exposing tissues over bone to extensive dosage of either radium or x-ray before operation.

Dr. Francis Carter Wood, who is a prominent x-ray specialist, concurs with me in this belief. Dr. Wood uses physical means for treatment, particularly deep x-ray, and he is of the opinion that if there is any possibility of operation, one should not—as preliminary to that—carry on deep therapy. It is perfectly all right, afterwards, to follow through with it.

The next is the use of curettement. In tumors that take on cystic formation, particularly the giant cell sarcoma, the curette has been used greatly to excess. I have had a number of very strenuous discussions with some of my colleagues as to whether a second curettage should be done, or a third, after recurrence. I wish to take a firm stand against either a second or third curettage of giant cell sarcoma, or any particular bony tumor with recurrence if complete removal is at all possible.

Illustrating this point is a case that I saw with a late eminent surgeon, who undoubtedly performed more curettements of bony tumors than anyone else. In this particular instance he had curetted the lower end of a femur and there had been a prompt recurrence. The patient came to me—not referred by the surgeon—and I recommended resection of the lower end of the femur and restoration of the loss of bone with a bone graft.

A day or so later, this surgeon telephoned me saying he understood that I had made a rather astounding recommendation to one of

his former patients, and that he would like to have a conference with me.

This case is mentioned merely to show the virtually impregnable attitude maintained on this question by a number of distinguished men in large metropolitan centers. A conference was arranged, and this surgeon arrived with three other eminent men whose experience along this line had been considerable. They all disagreed with me vigorously, and recommended another curettage. The patient, of course, accepted the operation of lesser magnitude. A second curettage was performed which resulted later in the amputation of the patient's leg, and subsequently his death.

Whether he could have been saved by a massive resection operation, of course, cannot be determined, but the possibility seemed very good. The case is only one of many that I have seen which illustrates how strongly men have clung to the curette in such tumors.

The next treatment that I am going to outline and discuss is that of massive resection with immediate bone graft replacement.

I have had many cases come to me where massive resection had been desired both by the physicians referring the cases and the patients, but where such a procedure was absolutely impossible. A few days after returning from Germany I saw a case where plastic operation was unthinkable because of the leathery condition of the skin and the soft spots underlying it—a condition caused by excessive exposure to deep x-ray therapy, which should have been a post-operative procedure.

At one of the large medical meetings in the West, I happened to hear a discussion by one of the important officials of the American College of Surgeons—and, by the way, he is one of the custodians of the bone tumor registry, if you wish to call it that, which they have developed.

In view of this man's experience and professional standing his reaction to resection was quite suggestive and significant. In talking with him, someone mentioned resection, and he said: "Oh, well, of course you get such tremendous shortening of the limb with resection that it is not of much advantage. You might as well amputate."

From his extensive observation of what was being done for bone tumors he didn't even take into consideration the recommended replacement by a bone graft.

The last type of treatment I wish to speak about is amputation.

Comparing the results of massive resection with amputation from statistics at my disposal, the results as to life saving are just about the same in resection as in amputation. When considering limb preservation and aesthetism, resection is gratifyingly favored.

Of course, resection is a suitable procedure only in the early stages of the disease, so the comparison might not be quite favorable from that standpoint. However, as Dr. Bauer stated in his paper on cancer of the lung, if the profession is on the job and makes the diagnosis early, then we won't have these very late cases, providing the patient can be induced to have the operation. That is where a very important consideration comes in: I find patients are very willing to accept resection when it means a preservation of their limbs, whereas my persuasive ability is not sufficient to induce them to have amputations when they first come into my care. Right here we have an advantage in favor of resection. A very large percentage of them will submit immediateiy to resection and the preservation of their limbs, whereas if amputation is recommended, they go away and get a little deep therapy, or curettage. Then when they do come back for amputation, they present a much more unfavorable case than if resection had been done in the beginning.

Because of this latter consideration, and as a lifesaving measure, resection has the advantage of an early acceptance.

For the last three years, I have operated on quite a number of cases, but I refrain from including those. My report will cover the treatment of twenty-one cases, all *over* three years' duration. Among these there are four humerus cases; seven lower end of femur cases; two upper end; five tibia cases; two knee cases—including involvement of the patella where the whole knee had to be swpt out; and one ankle case. While the number of cases may not be large, they are nevertheless conclusive ones. My oldest case, without recurrence, in this series, underwent an operation twenty-one years ago.

In some cases, resection of the whole knee joint, the extreme upper end of the tibia, and one-half of the shaft of the femur was done. Whenever possible, the condyles of the femur are left in to preserve motion at the knee joint.

But in all of these cases, the bone graft replacement was so satisfactory that none of them suffered from more than one and a half inches of shortening.

Only four of these cases died. One of them, an osteogenic sarcoma case had a complication of Paget's disease. The region was the tibia, the central portion of which I resected generously. The patient lived two and one-half years after that, and then died from osteogenic sarcoma of the skull. This was not metastatic, but was dne apparently to primary tumor of the skull.

There was one case of Ewing's tumor. In this instance there was no local recurrence, but the boy died about two years afterwards from a metastasis to the lungs. This case was a very interesting one to diagnose. I would say, right here, that all these cases have been carefully followed by competent pathologists, and most of them have been reviewed by Dr. Ewing himself.

This particular boy of twelve, with a tumor in the central portion of the tibia, presented a difficult problem to diagnose by x-ray. My opinion was that it was a malignant sarcoma. An x-ray man, whom I had in consultation, believed it was a chronic osteitis. He was so sure of his ground that he asked me to allow him to take the x-rays to the Cornell Medical School where he wished to consult the whole roentgenological department.

I readily acquiesced to this. He came back with the report that everybody agreed with him that it was a chronic osteitis.

Then I said, "I must have a biopsy." So we took out a generous piece of bone and had this examined. I sent a specimen to the pathological laboratory of the New York Post-Graduate Medical School and Hospital.

The first report, before decalcification was done, came back reading, "chronic inflammatory." When that came in, I began to weaken a little bit. I thought that my diagnosis from x-ray findings alone must have been wrong. Then, when the second report, after decalcification, came in—"chronic inflammatory," I was absolutely convinced that I had been wrong. But ten weeks later, when that poor boy came back with a tumor protruding through the biopsy wound in the cortex of the tibia, it was obvious that my original diagnosis had been right.

It was the most fortunate thing in the world for my peace of mind that this boy had a very understanding mother. She was no other than the former technician of the great Noguchi, the Japanese scientist. I showed her the written opinions of the x-ray men, as well as the opinions of the pathologists. She agreed to let her son undergo a resection operation of the whole diaphysis of the tibia, with immediate bone graft replacement. The boy broke his graft; then I inlaid another graft into the original graft, and it united beautifully. There was no local recurrence. After about three years, metastasis appeared in the lungs and he died.

The fourth case lost out of my twenty-one was an osteogenic sarcoma of the tibia, and in this instance metastasis appeared in the spinal cord.

These cases varied from twelve to fifty-nine years of age. The character of the tumors was as follows: eight osteogenic sarcoma; one complicated Paget's disease; seven recurrent giant cell tumors; four osteochondrosarcoma; and one Ewing's tumor. They were all carefully studied by competent pathologists, and the end results, as to preservation of life, were about the same as we would get in amputation.

The thing that has impressed me as I have gone on with these cases was the possibility of excising these tumors. One might say, "It is impossible to get that tumor out because it has by x-ray evidence, infiltrated into the soft parts." But still, if it is in a reasonably favorable place in the body, particularly the lower end of the femur, or any part of the femur or the humerus, it can be done. The most difficult region is at the upper end of the tibia and fibula where the blood vessels and nerves concentrate at the interosseous space.

But a notable fact is that after the severance of the shaft of the bone involved, at a safe distal point from the tumor, if one can turn the tumor forward or upward, one will find that as the malignancy spreads outward, a membrane forms between the tumor and the normal soft structures, allowing the most un-

expected degree the separation of malignant tissues from those uninvolved by blunt or digital dissection.

The rest of my time will now be devoted to showing you motion pictures in color of the technique I employ in massive resection and immediate bone graft replacement.

Here is a movie in colors showing a case of an osteogenic sarcoma proven by a biopsy done a short time before. You see the whole lower part of the thigh opened up, revealing the lower end of the femur involved in a very large tumorous mass. At a generous distance above the upper confines of this tumor, the femur is severed by means of the motor saw and the osteotome. The upper end of the involved femoral fragment is then seized with a Lambotte clamp, pulled out, and with blunt digital dissection, the whole tumorous mass incorporating the lower end of the femur is separated away from the healthy soft tissues of the thigh. After careful study of the lower end of the involved femur, it is found possible to sever the femur just above the condyles and still remove all of the malignancy. This is done, and the bone graft replacement proceeded with as I have already described.

I wish to say that the motor saw is, if course, indispensable. When I first began doing operations like this, I used the Gigli saw, but soon found it unsatisfactory and turned to my motor saw, which was ideal for severing the shaft of the femur, or other long bones.

The colleague you see in the motion picture is a pathologist, whom I always have right at my elbow in massive resection operations. I won't trust myself completely. I must have someone to support me in my opinion as to whether I have removed all of the malignant tumor or not. I don't trust the frozen section examination very far, but it is about all we can do immediately at the operation. If we are in doubt, the thing to do is to have the pathologist send a tissue specimen to the laboratory for immediate examination.

After blazing away on bone surgery all these years, I am either getting gray enough, or have lost enough hair to begin to speak with some authority and certainty upon the subject of bone surgery. And I should like to appeal to the profession, once and for all, to do away with tinkering methods in dealing with dangerous and hazardous diseases. Illustrative of the present surgical trend is the fact that the profession, being loath to accept the responsibility of doing a difficult piece of bone precision work, prefers to resort to the use of metal. This, however, is one of the outstanding instances where metal cannot be trusted.

As you will notice, in completely resecting the lower end of the femur with the condyles, in our replacement structure, we have a future hazardous breakage point in the knee region where the graft joins the tibia, and therefore, we have two ways of increasing the bony mass at that point.

One way is to split the graft as you would split a piece of wood in making a crutch, spring it apart, then put two prongs down and mortice them in the outer and inner side, at the top of the tibia from where the cartilage has been removed.

The other way is to mortice a single graft into the center of the top of the tibia, then put several short grafts, about three inches long, around it in form of a pyramid. These grafts will amalgamate, and stimulate the bony expansion of the new femur above its condyles, thus adding strength where it is imperatively needed.

In my later technique, in order to avoid the greatest enemy the surgeon has — the post-operative hematoma—all the muscles are sutured snugly around the graft.

Number one chromic catgut, continuous link suture material, is used, which is placed in with a large curved, round-pointed needle. One does not want a cutting edge needle because of the danger of severing the capillaries. And, incidentally, these sutures should be done in layers.

The post-operative immobilization is most important. For the lower end of the femur, double spica of plaster of paris is the best method. The grafts are always morticed in such a way as to prevent the shortening of the limb.

Bone grafts being supportive tissue, respond to Wolff's Law of Stress and increase in size and strength in direct ratio to the functional demands exerted upon them. Not only do living bone transplants become part of the osseous system where they have been implanted, but nature, in compliance with that wonderful phenomenon — the bio-physiological

law of living bone—further provides blood vessels and collateral circulation in the interior of the grafts themselves. The working of this bio-physiological phenomenon is beautifully exemplified in these extensive skeletal replacements in that a strictly cortical graft will become canalized by blood vessels from the host tissues, and as the graft increases its diameters, while taking on its new supportive functions, these blood vessels will so far increase in their number and size that a marrow cavity is eventually established completely throughout the graft which may be as much as twelve inches in length.

The child you see in this movie, while standing on the sidewalk, was run into by a boy on a bicycle. Her right thigh was lacerated near the metaphysis of the lower end of the femur. Eighteen months after, directly under the old laceration scar, there developed an osteogenic sarcoma. The important question arises: did the trauma, eighteen months before have anything to do with producing sarcoma? It would be most difficult to dissociate the etiology of that tumor from the trauma. This case later developed into a very important medical - legal problem, and the Court found in favor of the plaintiff and awarded the child a large sum.

The result was so excellent that I can assure you that it was not a distasteful case to testify about in Court, inasmuch as I had been able to save the condyles of the femur, and preserve the function and length of the limb, following a bone graft replacement of about eight inches of the shaft of the femur.

The next case to be displayed in the movie is that of a young woman in whom, twelve years before, I had removed the whole knee joint, including one-half of the lower end of the femur, for osteogenic sarcoma. This young woman returned to me eight years later requesting that I do an arthroplastic operation at her knee to restore motion.

This was necessary because of the fact that formerly I had not used a sufficient number of bone grafts in building up a so-called pyramidal enlargement at the lower end of the new femur. Her request presented great difficulty and I informed her that the only way I could build her a knee joint was to first enlarge the lower end of the femur laterally by implanting additional grafts previous to the attempt to restore motion sufficiently so that a stable knee joint could be constructed. Thus far, this patient has hesitated to have this surgical work done. I hope, however, that she will submit.

The next illustrative case I wish to briefly mention is my oldest one of osteogenic sarcoma of the upper end of the humerus, which I operated upon 21 years ago.

The head and upper half of the humerus were completely resected with immediate replacement from the upper half of the fibula, the head of the fibula being used to replace the head of the humerus. You will note that the function of this woman's arm has been so completely restored that she is shown playing a piece of classical music upon the piano 20 years after the removal of the sarcoma.

57 West 57th Street.

DISCUSSION

DR. ALFRED R. SHANDS, JR. (Wilmington): We have seen, of course, a perfectly beautiful demonstration of the technical procedures of this operation which Dr. Albee has described. I cannot help but pay Dr. Albee the compliment that he is without a doubt the master bone surgeon in his field in America today.

I think there are several rather interesting things in what he has told us. The first part is the question of the hazard of the x-ray and the radium treatment before operation. I must say that that has not been impressed upon me. My experience with these cases is extremely limited, compared to Dr. Albee's, but I can see the reason and the rationality of that. I believe he is right, and I believe that if a case is a resectible one that that should be done first, and all of the x-ray and radium therapy should follow.

I also think the point he has brought out about the dangers of continued curettage of the giant cell tumors is important. I concur in this opinion, and can say definitely that I think the same.

It is interesting to hear him say that the fatality rate for the resection cases is the same as for the amputation, assuming, of course, that they are both taken at about the same time.

The answer to whether this is or is not a sound procedure to be done at the time, I think, is in the report he makes of the maxi-

mum shortening of these limbs being not more than one and a half inches. I think if you are going to resect a tumor of this type, certainly the graft should be done at the same time that the tumor is resected, although this is not the general custom.

I have enjoyed Dr. Albee's paper, as I have always enjoyed them in the past, and I can say that I think you have seen and heard a perfectly beautiful demonstration of this subject.

DR. IRVINE M. FLINN, JR. (Wilmington): It has been most interesting to hear Dr. Albee's paper. I have seen a demonstration of it before at one of the meetings I have attended. The only thing that needs to be brought out so far as the type of case that should be done in this particular line of work is concerned is, as Dr. Albee also intimated, that it must be done extremely early. If it is done late, then we are certain of getting metastasis, as Dr. Albee had in one or two of his cases.

I had one case that I operated on and did practically the same thing, back around 1930. It was very interesting from a good many points of view. I have the x-rays, but it is getting late, so we won't bother to show them. This man had had trouble since 1926. He had pain in his hip, and finally I saw him in the clinic. At that time we took some x-rays and he definitely had something in the trochanter region of the femur. After about two months or so I decided that we were getting absolutely nowhere and a biopsy was indicated. This was done and slides were sent to three different pathologists throughout the country, one in Baltimore, one in New York, and one in Boston.

Different diagnoses were returned in each case. One said it was malignant, the other two said it was not. Therefore, we instituted deep x-ray therapy, and again got nowhere. Finally, he fractured through the site of the biopsy which I had done.

I lost sight of him for a while. He healed up that fracture and then had another through the same location. I finally found him again. At that time there had been advised a disarticulation of the hip joint. That struck me as being a pretty serious procedure and that certainly resection of the tumor at the time of operation with bone graft would give him a better chance of life.

So, finally, the tumor was resected, and about four inches of the shaft of the femur removed. We made sure to get all of the main tumor. I think there is a little at the top of the trochanter, but it has never increased in size. I used the fibula instead of the tibia for the graft.

This case is very interesting, I believe, because it brings up a point that Dr. Albee brought out. After all, he used deep x-ray therapy before the operation. Fortunately, we had no untoward results, but I have a feeling that Dr. Albee is right, that too much x-ray before operating on bone tumors would not insure success.

Then, after about three months, I took the patient out of the cast and he became a little too optimistic. He promptly fractured his graft. This healed, which, as Dr. Albee says, they frequently do. A little later on the position, which had become bad during this procedure in spite of all we could do to keep the leg in abduction, went over. So an osteotomy of the graft was done. This healed. The only difference between Dr. Albee's excellent results and this is that I have five inches of shortening, but the man is walking on his leg.

DR. ALBEE: Doctor, I want to thank the gentlemen for their very kind discussion. I haven't anything else to say.

Court of Appeals Rules Against Brinkley

Last week the United States Fifth Circuit Court of Appeals of New Orleans upheld a Federal district court decision in the libel suit brought by John R. Brinkley against the editor of *Hygeia*. The statement of the court in making this decision was as follows:

> We are spared the necessity of discussing the assignments of error in this decision and of reviewing the evidence. It is sufficient to say that the evidence of the plaintiff, placed on the stand by the defendant, tends to show the truth of the statements of fact complained of, and we find no substantial evidence tending to show the defendant was actuated by malice or that plaintiff suffered any actual damage compensatable in money.

(*J. A. M. A.*, March 9, 1940, p. 874).

EDITORIAL

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Local news of possible interest to the medical profession, notes on removals, changes in address, births, deaths and weddings will be gratefully received.

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Cancer Control: Early Is the Word

Cancer is a curious foe. Second only to heart trouble as a killer and most feared of all causes of death, cancer is in its early stages one of the most curable of serious diseases. Its definite diagnosis requires the services of a highly trained pathologist, but early symptoms which may mean the disease is present are easily recognized by any alert individual. Once cancer is diagnosed the preferred treatment is by a group of specialists and yet the key man in the whole picture of cancer control is the general practitioner to whom patients come for periodic examinations or for advice about apparently harmless conditions. While late cancer causes considerable suffering, in the early stages it is nearly always painless.

It is fitting that this paradoxical disease should be fought by an army, not chiefly of men but of women, an army not of destruction but of education, and its war should be a war to save life. Four years ago a small group of physicians, research workers, and club women launched the Women's Field Army of the American Society for the Control of Cancer. Its goal was to reduce cancer mortality and to arouse the interest of men and women everywhere in this disease and the methods and facilities available in their communities for treating and controlling it. Between one-third and one-half of those who now die could and should be saved by early diagnosis and prompt treatment, declared the American Society for the Control of Cancer.

The growth of the Women's Field Army has been rapid. Divisions are now under way in forty-six states, cancer information centers —local units of the army—have been established in more than half of the counties of the country. Cancer control is receiving more attention than ever before.

A beginning has been made, but only a beginning in this peacetime war. Approximately 150,000 men, women and children were destroyed by cancer in 1939. The needs in the field are great: more clinics, more funds for research, more facilities for indigent patients, above all, more education for the general public.

Working under the supervision of physicians and other experts, women are the leaders and organizers of the fight against cancer. However, the most paradoxical thing about this complex disease is that we cannot leave its control to leaders, to research workers, or medical men. We must all do our bit.

The Field Army suggests three measures that each one may adopt and so play a part in cancer control:

1. Have a comprehensive physical examination once year, however well one feels. Women over thirty-five years of age should have what the American Society calls the

B. P. Examination, covering the breast and pelvic areas, semi-annually.

2. Memorize the cancer danger signals, early and usually painless symptoms that may mean the disease is present and should always mean a visit to a physician. They are: any persistent lump or thickening, particularly in the breast; any irregular bleeding or discharge from any body opening; any persistent and unexplained indigestion; any sore that does not heal normally, especially about the tongue, mouth or lips; any sudden change in the form or rate of growth of a mole or wart.

3. Enlist in the Women's Field Army in April, set aside by Special Act of Congress as Cancer Control Month, and so help the army carry on its work of education to save lives.

Educate, Save, Enlist. These are the imperatives of the war against this disease. One more word should be emphasized. It occurs in this editorial many times. The word is *Early,*—and *Early Is the Watchword in Cancer Control.*

THE CANCER CAMPAIGN

The Delaware Division of the Women's Field Army of the American Society for the Control of Cancer is conducting its drive for funds during the month of April. They ask for a modest sum of money to carry on the educational campaign throughout the state.

Mrs. William H. Beacom, Wilmington, is state commander of the Field Army, and Mrs. Thomas B. Young, Wilmington, adjutant and executive secretary. The vice-commanders are Mrs. William N. Cann, Wilmington, for New Castle county; Mrs. Maxwell Harrington, Dover, for Kent county, and Mrs. Topp M. Heath, Frankford, for Sussex county. Headquarters for the Delaware committee are at the Delaware Academy of Medicine.

WOMAN'S AUXILIARY, A. M. A.

It won't be long now before the Woman's Auxiliary to the American Medical Association will be convening at the Hotel Pennsylvania, New York City, for their 18th annual convention to be held June 10 to 14, 1940. Is your reservation in? We are sure you will want to stay at the headquarters, Hotel Pennsylvania. In order to get a reservation, mail your request today to Dr. Peter Irving, Housing Bureau, Room 1036, 233 Broadway, New York City.

DELAWARE ACADEMY OF MEDICINE TENTH ANNIVERSARY

Plans are now being completed for the banquet which is to be held at the Academy on Thursday evening, May 9, at 6:30 o'clock, to celebrate the tenth anniversary of the founding of the Academy.

A short summary of the Academy's history will be given by Dr. W. H. Kraemer, the treasurer. Dr. Charles M. A. Stine will bring a message from the board of directors. The guest speaker of the evening will be Dr. O. H. Perry Pepper, vice-president of the College of Physicians of Philadelphia, and a past president of the American College of Physicians. The Governor of the State, Honorable Richard C. McMullen, members of the board of directors, and other distinguished invited guests will attend. Dr. Lewis B. Flinn, president of the Academy, will act as toastmaster. Dr. C. L. Munson, chairman of the scientific committee, is in charge of arrangements for the banquet.

La France Inhalator

This is a portable apparatus designed for the administration of a mixture of oxygen and carbon dioxide in cases of asphyxia. Standard equipment includes a carrying case with two 16 cubic foot cylinders connected through valves to a rubberized cloth reservoir, which is in turn connected by rubber hose to two face masks and head harnesses. The inhalator may also be obtained with only a single cylinder, with which an outboard connection for use with 50 and 200 cubic foot cylinders is furnished. Accessories clipped in the case include tongue forceps, an oral screw, and two wrenches for making the necessary connections. All the cylinders contain 70 per cent carbon dioxide. As a result of the Council investigation it was concluded that the La France Inhalator appears to be a well designed and constructed piece of equipment. The American La-France-Foamite Corporation, Elmira, N. Y. (*J. A. M. A.*, March 16, 1940, p. 961).

MEDICAL AND PUBLIC HEALTH EXHIBITS

The Medical and Public Health exhibits at the New York World's Fair, which were attended by 7,500,000 visitors in 1939, will be reopened for the 1940 season beginning May 11, it was announced by Dr. Louis I. Dublin, acting chairman of the American Museum of Health.

New exhibits, the nature of which will be made public before the opening date, will be added to the Carrel-Lindbergh "heart," the "transparent man" and other dramatizations of medical science which vied last year with such industrial features as the General Motors Futurama and the American Telephone and Telegraph Company's "Voder" as drawing cards for Fair visitors.

The outstanding value of the Medical and Health exhibits in spreading knowledge of hygiene among millions of persons is emphasized by Dr. Thomas Parran, Surgeon-General of the United States Public Health Service, in the following letter to Dr. Dublin:

"It is gratifying to learn that the continuation of the Medicine and Public Health Building at the New York World's Fair is assured for 1940 under the direction of the American Museum of Health.

"The unprecedented success of this undertaking last year should give you every confidence that the Museum will continue its high service to mankind.

"The studies of visitor reaction in which the Public Health Service cooperated with you clearly show that the exhibit gave to several million people from the United States, Canada and elsewhere, valuable, life-saving knowledge. The unquestioned scientific accuracy of the exhibits and the high-grade showmanship under which they were presented were no doubt responsible for the large and enthusiastic audience. I am sure you will have no difficulty in repeating and increasing your marked success of last year."

When the 1939 Fair opened, said Dr. Dublin, it was estimated that 3,000,000 persons would view the health exhibits if the Fair's attendance totaled 40,000,000. The number of visitors to these exhibits, however reached the unprecedented figure of 7,500,000 out of a total Fair attendance of 26,000,000, or approximately one person out of every third visitor attended the Medicine and Public Health Building exhibits. This attendance has never been equalled by a similar exhibit anywhere, the nearest being that of the Hygiene Museum at Dresden which had a total of 5,500,000 in 1911.

THE EDUCATIONAL QUALIFICATIONS OF HEALTH OFFICERS*

The type of training most desirable for an individual seeking to become a health officer is well recognized. He should have had fundamental training in the sciences and the humanities at least equivalent to that required for a college degree in Arts or Science. He should have completed the course leading to the degree of Doctor of Medicine in a recognized medical school, and should have had at least one year of internship in an approved general hospital, including a communicable disease service. In addition to such internship the candidate should be given a preliminary period of supervised field experience in a well organized department of health for a period sufficient to give him acquaintance with the general aspects of public health, and to give him also opportunity to determine something of his own liking for the work and his fitness for it. At the end of this preliminary field experience the candidate should receive at least one full academic year of graduate instruction in public health in a university. If possible the candidate should have an additional year of practical experience in a subordinate position before becoming himself responsible for the conduct of the work of a department of health.

However desirable so complete a course may be, it is impracticable at this time to insist that all candidates for appointment comply with these requirements. In view of this practical situation some modification may temporarily be made in the direction of recognizing the value of practical field experience obtained under competent supervision as in some measure substituting for formal education.

Certain individuals not possessing a medical degree have achieved success as administrative health officers. It is reasonable,

* Approved by the Governing Council of the American Public Health Association, October 18, 1939, on recommendation of the Committee on Professional Education.

therefore, that the basic training represented by the medical degree, although advisable, need not necessarily be considered absolutely essential in the selection of health officers for jurisdictions where the duties of the health officer are mainly administrative, provided the candidate possesses an adequate general and biological education, has received not less than 2 academic years of graduate instruction in public health, and has had one or more years of administrative experience in some position in a recognized health organization as prerequisite for the duties of health officer.

Because of the unmistakable trend upon the part of governmental bodies to insist upon the medical degree as a prerequisite to appointment as health officer, and because it is impossible to foresee whether the prospective health officer will be located in a health department where his duties are restricted to administrative functions, it is inadvisable to encourage the candidate for a public health degree to look forward to a career as health officer unless he is also the possessor of a medical degree, and for these reasons our recommendations contain no reference to the non-medical health officer.

RECOMMENDATIONS

1. That candidates for appointment as health officer should be graduates of approved medical schools who have completed successfully not less than one year of internship in an approved hospital and in addition a course of not less than one year of graduate instruction in a university, leading to a degree in public health.*

2. That recognition be given to the fact that practical experience in public health administration is an essential part of the education of a health officer, and that great achievement can usually be attained only after long experience. These facts should always be taken into consideration in the selection of health officers, particularly where the position is one of great administrative responsibility.

* Where lack of qualified personnel makes it impossible to require a full year of graduate instruction in public health, the postgraduate requirements considered temporarily as applicable for medical health officers for small jurisdictions may be: the satisfactory completion of not less than 3 months of postgraduate instruction in public health in a university, and not less than 3 months of supervised field experience in a well organized health department. Such individuals should be required to complete the course leading to a graduate degree in public health as soon as they have demonstrated ability sufficient to warrant such instruction.

The above recommendations are made for the future guidance of officials responsible for the appointment of health officers, and for the guidance of individuals looking forward to careers in public health. In making these recommendations the American Public Health Association expressly recognizes the professional standing of persons now performing creditable service as health officers.

BLOOD PLASMA IS EFFECTIVE AGENT FOR TREATING SECONDARY SHOCK

Blood plasma (the clear fluid part of the blood before clotting has taken place), rather than whole blood or serum, is the most effective agent for transfusions to combat secondary shock, Max M. Strumia, M. D., and Joseph A. Wagner, M. D., Bryn Mawr, Pa., and J. Frederick Monaghan, M. D., of Philadelphia, declare in *The Journal of the American Medical Association* for April 6.

Secondary shock may occur in cases of bleeding at the site of injury, loss of plasma in bruised tissue, loss of plasma and red cell concentration in burns and in injury to the intestines. Other conditions bringing about secondary shock are cold, fear, pain, suffocation, infection and decrease in the fluid concentration of the body.

Pointing out that the treatment of shock requires rapid and permanent increase of the blood volume in order to overcome the circulatory deficiency which causes the condition, the authors contend that plasma combined with a citrate (a salt derived from the acid present in citrous fruits) overcomes the disadvantages of whole fresh blood or of preserved citrated blood. It avoids delays due to typing and cross matching of blood, it can be stored without the deterioration which occurs in preserved blood, it prevents the undesirable addition of red cells to the patient's already concentrated blood and it avoids damage to the red cells occurring during transportation. This last factor is especially important in war conditions, when transportation is such a vital factor and when shock is especially apt to occur because of the depleted body reserves and the abnormal nervous strains to which soldiers are subjected.

The use of plasma also has advantages over serum, the clear portion of the blood *after*

clotting, the authors point out. While neither agent requires typing, the severe reactions to serum which often occur are eliminated by the use of plasma. Moreover, there is a greater yield of fluid when citrated plasma is separated by centrifugation.

In their hospital, the authors state, blood plasma is a by-product of the blood bank. After blood has been in the bank for five days and is no longer at its best, the plasma is separated, pooled and stored.

The authors recommend the routine administration of plasma to all patients with severe injuries, regardless of the loss of blood. This will prevent the occurrence of shock or assure recovery if shock has already occurred. "Later on," the authors say, "the actual degree of anemia can be estimated, and transfusion with whole blood resorted to if considered essential to recovery or, as more commonly occurs, useful to shortening the period of convalescence."

SHOCK IS DUE TO CIRCULATORY DEFECT ORIGINATING IN THE CAPILLARIES

The condition known as shock, which may follow severe physical injury or extensive surgical procedures, results from a deficiency of blood circulation originating in the capillaries (minute blood vessels connecting the small branches of arteries and veins) rather than in the heart itself, Virgil H. Moon, M. D., Philadelphia, says in *The Journal of the American Medical Association* for April 6.

The mechanism involved includes the reciprocal effects of two major factors—capillary atony, or loss of strength, and deficiency of oxygen in the tissues. Either of these factors will presently cause the development of the other. Thus a vicious circle is set up.

In explaining how these two factors may originate, Dr. Moon points out that the capillary endothelium (the layer of cells lining the capillaries) is delicately sensitive to physiologic conditions such as oxygen deficiency and metabolic products. Likewise it is exceedingly susceptible to the action of a wide variety of injurious agents, including chemicals, poisonous drugs, anesthetics, venoms and bacterial toxins. Under the influence of any such agent the endothelium loses its normal strength and becomes abnormally permeable to blood plasma (the fluid portion of the blood), which escapes into the tissues. As a result there is a decrease in the blood volume, tending to lower the efficiency of the circulation.

In order to offset this the arteries tend to contract, thus requiring less blood. So long as this compensation is effective there is no serious decline in the blood pressure but the latter is maintained at the expense of the volume flow of blood. However, extensive constriction of the arteries may reduce the volume flow too low and seriously reduce the delivery of oxygen to the tissues. Capillary endothelium is sensitive to lack of oxygen, and when such lack develops in the tissues the capillaries again lose their strength and become abnormally permeable. This fact supplies the connecting link in the vicious circle of shock.

When compensation for the reduced blood volume, by arterial contraction and by discharge of the blood from such organs as the spleen, is no longer effective, the blood pressure declines progressively and the symptoms comprising shock appear.

These symptoms may arise from a wide variety of causes, Dr. Moon points out. Shock may follow extensive surgical procedures or severe physical injury. Its occurrence is common in war time, when it often results from a combination of factors rather than from a single one. These factors include absorption from injured areas, delay in operation, anesthesia, hemorrhage, infection exposure, exhaustion, cold and emotional reactions.

GRASS—ONE OF THE RICHEST SOURCES OF VITAMINS

"Please pass the grass" will be good dinner table etiquette if science confirms that man can eat grass as reported to the American Chemical Society at Cincinnati on April 8.

Powdered grass would be used in a shaker about as sparingly as salt. It would furnish all the vitamins that come from all the fruits and vegetables.

Evidence that plain grass is the richest source of these vitamins was reported by W. P. Graham, G. O. Kohler and C. F. Schnabel of Kansas City, Mo. They have developed a

powdered grass which can be added in cooking most foods, from flapjacks to desserts.

It can be put in bread, they said, without changing the flavor. Moreover, the bread and other foods won't turn green, because of a method of washing out the color without destroying vitamins.

Chemical analysis shows grass contains all the vitamins from A, the infection protector, to E, the fertility promoter, excepting only vitamin D, the bone hardener. Likewise fruits and vegtables do not contain D, although they supply chemicals which turn into D in the human body on exposure to sunlight.

Grass has 23 times more A than the fruits and vegetables, eight times more B-1, the nerve vitamin, 21 times more B-2, the growth vitamin, and 14 times more C, the anti-scurvy vitamin. Identified in grass also is the whole B-complex, including the pellagra preventor, nicotinic acid, and probably the recently found gray-hair-darkener vitamin.

Twelve pounds of grass was said to be a little more than equal in vitamins to the 340 pounds of fruits and vegetables which dietary surveys find the average person eats in one year.

Government nutrition figures, the report stated, advise that for best results each person should eat twice as much fruit and vegetables, or 680 pounds annually.

This, the Kansas City chemists said, would add $2,250,000,000 to the nation's annual food bill—too much, they estimated, for most modest family budgets.

Dried grass, they think, would put all these vitamins within reach of everyone. Vitamins now available from chemical synthesis, of which half a million dollars worth are sold annually in the United States, are mostly expensive.

Grass must be dried quickly in a flash high temperature to preserve its vitamins. If the powder is stored in an atmosphere of nitrogen the report said the vitamins retain their potency for two years.

Wilmington Journal-Every Evening,
April 8, 1940.

Carrier Room Ventilator, Type 56 B.

The following devices have been accepted by the Council on Physical Therapy of the American Medical Association for inclusion in its list of accepted devices for physical therapy:

Carrier Room Ventilator, Type 56 B.

This ventilator is designed to cause the circulation of outside and inside air in a room and to filter out dust and pollen. A damper provides means for adjusting the proportions of outside and recirculated air. Sound insulation is also provided in the mechanism. The ventilator comes in two sizes—the smaller one providing 250 cubic feet of air per minute and designed for average sized rooms, and the larger size, designed for larger rooms, offices and apartments, supplies up to 500 cubic feet of air per minute. The firm claims that the unit "supplies cleaned, outside air, without drafts; circulates filtered, refreshing, room air; shuts out noise, dirt, dust and pollen."

The firm submitted evidence to support these claims and the Council conducted an investigation to test their validity. These tests showed an efficiency of the unit for pollen removal of more than 97 per cent for the first week of operation. At the end of two weeks the efficiency had dropped to 96 per cent for pollen removal. Apparently the filter loses some of its efficiency in time for holding pollen. The filter is of the discardable type and should be renewed as frequently as local conditions demand. The Carrier Corporation, Syracuse, N. Y.

Sulfathiazole and Sulfamethylthiazole

Recently there have been reports that two derivatives of sulfapyridine, sulfathiazole (2(para - amino - benzene - sulfonamido) thiazole) and sulfamethylthiazole (2(para-aminobenzene-sulfonamido) 4-methylthiazole), give some promise of therapeutic effect. The Council on Pharmacy and Chemistry of the American Medical Association has not given consideration to the acceptability of the names sulfathiazole and sulfamethylthiazole. However, since the medical profession has such interest in sulfanilamide and its derivatives, the Council asked Dr. Perrin H. Long to prepare

a preliminary report on these two substances. Dr. Long reports that it is too early to pronounce on the comparative clinical therapeutic effects of sulfathiazole and sulfapyridine, but that experience to date indicates that sulfathiazole is about as effective as sulfapyridine in pneumococcic pneumonia in human beings and at least as effective as sulfapyridine, if not more so, in staphylococcic infections in man. Dr. Long concludes: "The evaluation of these new chemotherapeutic compounds will necessitate extensive experimental and clinical investigations in order to determine their efficiency in the control of infections and their clinical toxic manifestations. Until the time when such data are in hand it is to be hoped that enthusiasms do not outrun common sense." The Council concurs with the conclusions of Dr. Long. The two preparations have not been licensed by the Food and Drug Administration for sale in interstate commerce (as new drugs). This gives opportunity for the medical profession to be informed about the drugs before they are exploited. No firm has submitted these drugs for consideration by the Council. (*J. A. M. A.*, March 9, 1940, p. 870).

Thiazole Derivatives of Sulfanilamide

The introduction of sulfanilamide into American therapeutics early in 1937, as was to be expected, was soon followed by the presentation of a derivative representing a combination of pyridine and sulfanilamide, which received the non-proprietary term sulfapyridine. Now come reports of two more derivatives of sulfanilamide—sulfathiazole and sulfamethylthiazole. A preliminary report of the Council on Pharmacy and Chemistry, prepared by Dr. Perrin H. Long, on these substances appears in THE JOURNAL, March 9, 1940, p. 870. All of these sulfanilamide derivatives are quite similar in their basic character. One group of workers (Herrell and Brown) have stated that sulfamethylthiazole has been found efficient in the treatment of some infections caused by staphylococcus organisms. Further investigation of the effectiveness of the compound in diseases caused by staphylococci is decidedly in order, for if the product is found to be of value in these diseases it certainly will have advantages over sulfanilamide. Again it is fortunate that the product has not been placed on the open market before physicians are given an opportunity to know more about it. (*J. A. M. A.*, March 9, 1940, p. 873).

OBITUARY

GEORGE C. MCELFATRICK, M. D.

Dr. George C. McElfatrick, 59 years old, of Wilmington, died suddenly on March 20, 1940 in the Delaware Hospital of a heart attack while attending a meeting of the executive committee and staff of the hospital.

Chief of the X-ray Departments of both the Delaware Hospital and the Delaware State Hospital, and consulting roentgenologist to the Kent General Hospital, Dr. McElfatrick was ill a year ago from a heart condition, but apparently recovered. He returned to his regular duties several months ago.

Dr. McElfatrick was born July 18, 1881, at Drum Lane, Ireland, the son of George C. McElfatrick and Margaret Miller. His early education was received at Central High School, Philadelphia, and at the Robert Institute, Germantown.

His medical education was received at the Baltimore Medical College, where he was graduated in 1910. He then interned at the Delaware Hospital for a year, following which he began to practice in Wilmington. Following post graduate work in Philadelphia in 1915 he specialized in roentgenology and radiology, engaging in considerable cancer work.

Dr. McElfatrick was a captain and assistant surgeon of the First Infantry of the Delaware National Guard from July 12, 1912 to July 14, 1915.

In 1924 he was President of the New Castle County Medical Society.

In 1930 he was elected president of the Medical Society of Delaware. He was also a member of the American Medical Association and the New Castle County Medical Society and of the Radiological Society of North America, the Philadelphia Roentgen Ray Society and the American College of Radiology, the Philadelphia Journal Club, Medical Club of Philadelphia, University Club, Lions Club (past president), Masonic Club, Corin-

thian Lodge, A. F. and A. M., Knights Templar, Delaware Consistory, and Lu Lu Temple of the Mysic Shrine. He was also a diplomate of the American Board of Radiology.

His wife, Mrs. Elsie Eckman McElfatrick, and two children survive, Miss Sarah Elizabeth and George, a pupil at Tower Hill School.

He was a member of Westminster Presbyterian Church.

Funeral services were held on March 25, 1940, and burial was made in Lower Brandywine Cemetery.

BENJAMIN R. VEASEY, M. D.

Dr. Benjamin R. Veasey, one of Wilmington's veteran physicians, died on April 6, 1940, at his home, aged 80, of pernicious anemia.

In January he spent four days in a hospital at Miami Beach, Fla., but returned to his home here in March.

Dr. Veasey was born in Cecil County, Md., near North East, on December 2, 1859, the son of William and Ann Eliza Veasey. He engaged in the drug business in North East, and later in Wilmington, when in 1894 he became a member of the drug firm of Morrison and Veasey.

He was graduated from Jefferson Medical College, Philadelphia, in 1894.

Dr. Veasey was one of the last living founders of the old Physicians' and Surgeons' Hospital, the forerunner of the Wilmington General Hospital, where for years he was head of the Department of Proctology.

He served two terms in the State Senate in 1927 and 1930, after he was requested to run on the Republican ticket because of his strong dry views. He was also a member of the Wilmington Board of Education from 1893-1902.

Dr. Veasey's first wife, the former Mary E. Hickman, of Odessa, died in 1925. He married Susie M. Davis, of Milford, in 1927. Both Dr. Veasey and his first wife were charter members of Harrison Street Methodist Church.

Mrs. Veasey survives in addition to a daughter, Mrs. John Gilbert Craig; a son, Harold M. Veasey; and three grandchildren.

Dr. Veasey was a member of the Medical Society of Delaware, the New Castle County Medical Society, the American Medical Association, and was a fellow of the American College of Surgeons. He belonged to Eureka Lodge, A. F. and A. M., the Delaware Consistory, Lu Lu Temple, and the Shrine Club. He was also a member of the Jefferson Alumni Association.

Funeral services were held on April 9, 1940, and burial was made in Riverview Cemetery.

BOOK REVIEWS

Tomorrow's Children. Proceedings of the First Southern Conference on Tomorrow's Children, Atlanta, November, 1939. Pp. 169. Paper. Price, 75 cents. New York: Birth Control Federation of America, 1940.

These Proceedings comprise seven papers and ten panel discussions on various phases of the child question in the South. While some of the data presented, taken from government reports, has been shown by the A. M. A. to be incorrect, the information here contained is interesting and enlightening; we found the discussions of the economic problem and the Swedish population planning especially so. Dr. Woodbridge E. Morris, lately of the Delaware State Board of Health and now the general director of the Federation, contributes a paper on "who shall inherit the earth," and concludes it should be only the fit.

To summarize, this book relates chiefly to birth control, and will be of value to all persons who are interested in this subject.

The Management of Obstetrical Difficulties. By Paul Titus, M. D., Obstetrician and Gynecologist, St. Margaret Memorial Hospital, Pittsburgh. Pp. 968, with 368 illustrations and 5 color plates. Cloth. Price, $10.00. St. Louis: C. V. Mosby Company, 1940.

The second edition, like the first, differs from text books on the subject in that normal physiology is omitted; so are historical references. The author does not go into lengthy discussion of theory.

The subject matter is approached from the practical and clinical aspect. A great deal of attention is paid to abnormal obstetrics which usually give rise to difficulties and anxieties in practice. Obstetrical emergencies both major and minor are treated very carefully. Careful detail and attention is given to the diagnosis and management of these difficulties.

In instances where there is division of

opinion the author prefers to give his own method of management rather than give numerous methods and leave the student undecided.

Two chapters are devoted to sterility, including diagnosis and treatment. He also discusses sterility in the male. An intelligent and comprehensive estimate of the results of treatment is also discussed.

This new edition includes sulphanylamide therapy in puerperal sepsis. Detailed technic for roentgenographic pelvimetry is also included.

A chapter is devoted to obstetrical analgesia and anesthesia in which, among other methods, is included the more recent use of paraldehyde and spinal anesthesia. This edition is enriched by a number of new illustrations which better help to illustrate the text. The volume has been enlarged by a number of additional pages.

This book, though valuable for the student, if of greatest aid to the active practitioner. Those doctors who are training to specialize in obstetrics as well as the specialist will find this book very helpful.

Pneumoconiosis (Silicosis) The Story of Dusty Lungs—A Preliminary Report by Lewis Gregory Cole, M. D., Director of Silicotic Research, John B. Pierce Foundation, New York City, and William Gregory Cole, M. D., New York City. Pp. 102. Cloth. Price, $1.00 New York: John B. Pierce Foundation, 1940.

"The Story of Dusty Lungs" should be read by every physician, be he specialist or general practitioner. It is the result of four years of observation and intensive investigation. The outlines are well defined; the facts clearly stated.

In the conclusions herein recorded concerning the scientific aspects of the disease, its etiology, pathogenesis pathology, roentgenology, as well as its social, economic and legal aspects, the reader will find much that is far in advance of the present accepted theories on the subject. One must join with the authors in their logical conclusions.

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES, Vol. 23, No. 2, pages 201-206, March, 1939.

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